

REMARKS

Applicant has carefully reviewed and considered the Office Action mailed February 29, 2008. Reconsideration of the application is respectfully requested in view of the foregoing amendments and comments set forth below.

By this Amendment, claims 1 and 8 are amended to clarify the structure of the claimed invention. Accordingly, claims 1-6 are pending in the present application.

Claims 1-3 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,698,036 to Ishii et al. (hereinafter referred to as “Ishii”) in view of U.S. Patent No. 6,388,632 to Murakawa et al. (hereinafter referred to as “Murakawa”) and U.S. Patent No. 4,970,435 to Tanaka et al. (hereinafter referred to as “Tanaka”). Claim 4 was rejected under 35 U.S.C. §103(a) as being unpatentable over Ishii in view of Murakawa and Tanaka and further in view of U.S. Patent No. 6,346,915 to Okumura et al. (hereinafter referred to as “Okumura”). Claim 5 was rejected under 35 U.S.C. §103(a) as being unpatentable over Ishii in view of Murakawa and Tanaka and further in view of U.S. Patent No. 5,395,453 to Noda. Claim 6 was rejected under 35 U.S.C. §103(a) as being unpatentable over Ishii in view of Murakawa and Tanaka and further in view of U.S. Patent Application Publication No. 2004/0244687 to Ichiki. These rejections are respectfully traversed.

As the Examiner admits, the slits of Ishii are not circular. In fact, Ishii discloses a slit having a width of 2mm and a length of 23.2 to 29.8mm. See Table 1 in column 9 of Ishii. Thus, in addition to failing to disclose the recited circular openings, Ishii fails to disclose the structure of the claimed invention that enables evanescent waves to be emitted into the plasma generation vessel.

It is the Examiner's position that the width of Ishii's slits are 1mm. However, as stated above the only width disclosed for slit in Ishii is 2mm. While the secondary reference to Murakawa discloses "T"-shaped slots in slotted plate 7, in the fourth embodiment shown in Figures 12-13 of Murakawa, a lower supporting member 6c may be formed of a plurality of circular openings. That is, Murakawa does not demonstrate that microwaves can pass through circular openings only in a slot antenna. To the contrary, one of ordinary skill in the art would reasonably understand Murakawa's disclosure as teaching that after going through the "T"-shaped slots of the slot layer, a dielectric lower supporting member with circular openings could be used. The lower supporting member is not a conductor with a plurality of circular openings, as recited in the claims.

The fourth reference in the combination asserted in the Action, Ichiki, is directed to an etching method and apparatus for processing a surface of a workpiece with use of a neutral particle beam generated by neutralizing positive or negative ions generated in a plasma. While Ichiki discloses an orifice plate or electrode having a plurality of orifices having a diameter of 1mm and a length of 10mm, the term "wave" is used once in the entire disclosure and that disclosure describes the source of the plasma. There is no disclosure of emitting evanescent microwaves into a vacuum vessel in Ichiki. The orifices taught by Ichiki have an area of $.785\text{mm}^2$ and a length of 10mm. As stated above, Ishii discloses slits having areas ranging from 46.4 to 59.6 mm^2 . It is respectfully submitted that one of ordinary skill in the art would not look to an etching method and apparatus for the size of circular openings in a conductor plate connected to a central conductor of a coaxial waveguide in order to emit evanescent microwaves from the

openings, as recited in claim 1. Further, one of ordinary skill in the art would not replace a much larger opening area (59x greater than Ichiki) taught by Ishii with the much smaller opening that is used for a different purpose as taught by Ichiki when Ishii is directed to a plasma processing apparatus for guiding microwaves and Ichiki is concerned with accelerating ions from plasma. That is, there is no reasonable basis to combine the two differing technologies with vastly different opening areas.

It is respectfully submitted that the asserted combination is based on picking and choosing elements, out of context, from one reference into another reference or combination of references to achieve the claimed invention. Moreover, in the claimed invention circular openings or holes are provided in the launcher plate, not slits as disclosed by Ishii and Murakawa. As argued above the diameter of the hole of the claimed invention is much smaller than that disclosed. In addition, the diameter of the circular opening of the claimed invention is much smaller than the cutoff wavelength emitted by the recited microwave source. That is, the wavelength λ of the excitation microwave is 122.4 mm (3×10^{11} mm/2.45-GHz) in free space. Therefore, the smallest diameter of a circular opening (d_h) would be 0.0082λ , or 1 mm. The largest opening of a circular opening (d_h) according to the claimed invention would be 0.065λ , or 7.96 mm.

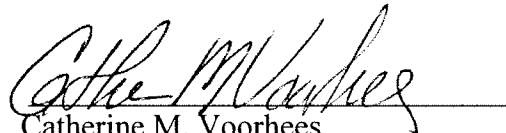
All of the cited references that relate to antenna type metal plates have slits, and each length of the slit is larger than one-half wavelength, therefore the antenna emits propagating electromagnetic wave into a cavity or space and they cannot emit evanescent microwave, as recited in independent claim 1. Consequently, Applicant believes that no combination of Ishii, Murakawa, Tanaka and Ichiki presents a *prima facie* case of obviousness as the references fail to teach, disclose or suggest the claimed invention.

For the above stated reasons, it is submitted that all of the claims are allowable over the prior art of record and are in condition for allowance. Therefore, it is respectfully submitted that this application be passed to issuance with claims 1-6.

It is believed that no fee is due, however, the Director is hereby authorized to charge any deficiency in the fees filed, asserted to be filed or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our Deposit Account No. 22-0261, under Order No. 31721-219467.

Should the Examiner believe that a conference would advance the prosecution of this application, he is encouraged to telephone the undersigned counsel to arrange such a conference.

Respectfully submitted,



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